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July 3/15

STORAGE REPORT

OF

THE DIRECTOR

OF THE

ROYAL OBSERVATORY, HONGKONG,

FOR THE YEAR

1914.



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REPORT OF THE DIRECTOR OF THE ROYAL
OBSERVATORY, HONGKONG, FOR THE YEAR 1914.

I.—GROUND AND BUILDINGS.

The grounds were kept in order by the Botanical and Forestry Department, with the assistance of the two Observatory coolies.

In the month of March blue grass (*ophiopogon*) was planted under the pine trees in the western portion of the grounds, and over the denuded area between the pine trees and the Kowloon School playground. This has improved the appearance of the grounds and will prevent erosion when the grass has spread.

The paths were considerably damaged by heavy rain in the summer months.

The new shed for the thermograph was completed early in the year and the thermograph mounted.

The roof of the main building was repaired by the Public Works Department on several occasions.

II.—METEOROLOGICAL INSTRUMENTS.

Kew Barograph.—This instrument worked well during the year. The temperature compensation is now practically correct.

Beckley Anemograph.—The electrical time-break apparatus has failed occasionally. The three-minute contact every half-hour made too great a demand on the battery of 14 dry cells. An accumulator set of ten three-plate Tudor cells, of 27 ampère-hours capacity and 9 ampères maximum discharge, was put in by the Public Works Department in the month of November. The installation was not completed by the end of the year.

The spindle of the direction apparatus became disconnected from the recording pencil on August 26. This was remedied on September 9. The Dines-Baxendell record was utilised in the interval.

Dines-Baxendell Anemograph.—With the exception of the electric time-break, which is operated by the same battery as the Beckley Anemograph, this instrument worked well during the year. A strong spring was fitted to the driving clock on February 12, in order to overcome the additional friction caused by unwinding the roll of paper from a spool, over a recording spindle on to the cylinder. It was found, however, that even with the stronger spring the friction was too great. The recording spindle was therefore

removed, and the record obtained directly on the cylinder. This has had the desired effect. The fact that the effective diameter of the cylinder increases with each successive layer of paper is unimportant, as the time-break is made electrically by an independent clock.

The monthly results of comparisons with the records of the Beckley Anemograph since the installation of the Dines instrument in April, 1910, are given below:—

Month.	Factor (Dines $\div \frac{\text{Beckley}}{3}$).				
	1910.	1911.	1912.	1913.	1914.
January, .....	.....	2.33	2.30	2.12	2.54
February, .....	.....	2.34	2.32	2.30	2.40
March, .....	.....	2.30	2.35	2.25	2.33
April, .....	.....	2.27	2.33	2.26	2.25
May,	2.23	2.25	2.34	2.22	2.13
June,	2.23	2.10	2.44	2.09	2.13
July,	2.14	2.21	2.57	2.28	2.26
August,	2.07	2.25	2.65	2.39	2.18
September,	2.18	2.31	2.49	2.81	2.22
October,	2.30	2.27	2.51	2.69	2.08
November,	2.28	2.27	2.47	2.71	2.08
December,	2.23	2.31	2.24	2.54	2.07
Year,	2.25	2.29	2.41	2.39	2.22

Kew Thermograph.—This instrument was mounted in the new thermograph shed in the month of January, and a 12-inch electric fan set up in the shed in a 14-inch zinc pipe, at a distance of 6 feet from the thermometers. The fan is operated from the 59th to the 60th minute of each hour by a contact on one of the mean time electric dials, so that exactly at the hour, when the thermogram is measured, the wet bulb thermometer should show the true temperature of evaporation. It was found however that with the fan at this distance the air current produced over the thermometers was very feeble; the fan was therefore moved 2 feet nearer the thermometers which are now well aspirated every hour.

Aneroid barometer tester.—This apparatus was received in the month of August. A teak cover was obtained locally to protect it from breakage. It consists of two glass cylinders, one 4 inches in diameter and $6\frac{1}{2}$ inches high, containing the cistern of a mercurial barometer, and the other 10 inches in diameter and 6 inches high for receiving the aneroid barometer to be tested. The glass cylinders rest on brass plates and are connected by a pipe to an air pump.

Apparatus for comparing thermometers.—This was completed in the month of March. It consists of a double water tank of teak, the outer tank being zinc lined. An inclined shelf serves as a support for the thermometers, which are read by a microscope on a jointed arm. The thermometers to be compared, and the standard, are read in rotation, from left to right and right to left alternately. The water is stirred by a fan on a vertical spindle, before each set of readings.

III.—METEOROLOGICAL OBSERVATIONS AT THE OBSERVATORY.

Continuous photographic records showing the variations of barometric pressure and temperature, dry and wet bulb, are obtained with Kew pattern instruments, and automatic records of the direction and velocity of the wind with a Beckley and a Dines-Baxendell anemograph, modified as described in the Report for 1912. The amount of rain is recorded automatically by a Beckley and a Nakamura pluviograph, the amount of sunshine by a Campbell-Stokes universal sunshine recorder, and the relative humidity of the air by a small Richard hair hygrometer.

Eye Observations of barometric pressure, temperature of the air and of evaporation were made at each hour of Hongkong Standard time. (Until the end of the year 1912 they were made at each hour of Hongkong Local time.) The character and direction of motion of the clouds were observed every three hours. Daily readings were taken of self-registering maximum and minimum thermometers.

Principal Features of the Weather in 1914.—The principal features of the weather in 1914 were the absence of violent typhoon winds, relatively high temperature in January, February and March, and excessive rains in July, September and November, with a relatively dry August, and a rainless January.

Barometric pressure was considerably above normal in January and October and moderately above normal from April to June. It was considerably below normal from July to September and moderately below normal in February, March, November and December.

The mean temperature for the year was $73^{\circ}4$, or $1^{\circ}7$ above normal. The highest temperature was $94^{\circ}0$ on August 31, as against $92^{\circ}0$ in 1913 and $97^{\circ}0$ for the past 31 years. The lowest temperature was $47^{\circ}4$ on January 1, as against $44^{\circ}0$ in 1913 and $32^{\circ}0$ for the past 31 years.

According to the records of the Beckley Anemograph the wind velocity was again below normal in each month of the year, except in July when it was $0^{\circ}4$ m.p.h. above. The greatest velocity for one

hour was 42 miles at 11^h a.m. on September 3. The maximum squall velocity on this day, as recorded by the Dines-Baxendell anemograph, was at the rate of 47·9 m.p.h. at 9^h 52^m a.m. The maximum squall velocity for the year was at the rate of 55·4 m.p.h. at 4^h 10^m a.m. on July 9.

Rainfall at four Stations.—In the following table the monthly rainfall at the Observatory is compared with the fall at the Police Station, Taipo; the Botanical Gardens; and the Matilda Hospital, Mount Kellet.

Months.	Observatory (Kowloon).	Police Station (Taipo).	Botanical Gardens (Hongkong).	Matilda Hospital (Hongkong).
	<i>inches.</i>	<i>inches.</i>	<i>inches.</i>	<i>inches.</i>
January,	0·000	0·000	0·000	0·000
February, ...	3·240	4·310	3·040	2·620
March,	1·190	1·690	1·540	1·300
April,	4·465	5·730	5·920	4·950
May,	12·620	13·590	13·480	9·800
June,	12·225	13·320	12·660	13·150
July,	26·305	34·270	23·370	22·420
August,	4·205	5·320	6·130	3·530
September, ...	19·980	22·410	21·020	25·250
October,	6·450	4·750	10·670	10·320
November, ...	8·815	11·580	9·100	9·260
December, ...	0·720	1·130	1·120	0·770
Year, ...	100·215	118·100	108·050	103·370

Typhoons.—Six typhoons passed within 300 miles of Hongkong during the year, but no destructive winds were experienced. The greatest squall velocities were at the rate of 55·4 m.p.h. at 4^h 10^m a.m. on July 9, and 47·8 m.p.h. at 9^h 52^m a.m. on September 3. The tracks of 16 typhoons and 6 of the more important depressions which occurred in the Far East in 1914 are shown in two plates in the monthly Meteorological Bulletin for December, 1914.

From August 19 to September 5 there was a shallow depression over the China Sea in which a series of typhoons formed. One passed about 100 miles to the south of Hongkong on an ENE track on August 24, remaining nearly stationary on the 25th and 26th, at a distance of about 120 miles E by S of Hongkong. It appeared at the time, from the available information, that this typhoon formed to the West of the Bashi Channel and moved North-westward.

A typhoon formed over the Batan Islands on the morning of September 19, and after moving towards the Pescadores for about 24 hours, curved sharply to the South-west and approached to with-

in 130 miles of Hongkong on the morning of the 21st, when it curved to Northward. From the information to hand it was thought that this typhoon had entered the coast near Amoy and filled up on the afternoon of September 20.

These two typhoons emphasize the fact that until weather reports can be obtained promptly from such stations as Pratas, Chelang Point, Swatow, Kwong Chau Wan, and the south point of Hainan, a repetition of the 1906 typhoon disaster may confidently be expected, sooner or later.

IV.—WEATHER FORECASTS AND STORM WARNINGS.

Daily Weather Report and Map.—A weather map of the Far East and the Daily Weather Report, containing meteorological observations, usually at 6 a.m. and 2 p.m., from about 40 stations in China, Indo-China, Japan, and the Philippines, and a daily weather forecast for Hongkong and district, the Formosa Channel, the south coast of China between Hongkong and Hainan, and the south coast of China between Hongkong and Lamocks, were issued as in former years. Copies of the map were exhibited on the notice boards at the Hongkong Ferry Pier, the Blake Pier, and the Harbour Office. One copy was sent daily to the Director of the Meteorological Observatory, Macao. The maps were reproduced from the original by the Roneo Litho duplicator from November 5. Prior to this date they were traced. Forty copies of the Daily Weather Report were distributed to various offices, &c., in the Colony, and a copy was sent daily to the Director of the Meteorological Observatory, Macao. Copies were sent every week to the Hydrographic Office, Tokio, and to Lieut. Commander Pradyat, Royal Siamese Navy; and every 10 days to the Director, Central Meteorological Observatory, Phulien. An exchange of daily weather maps and reports was made with the Royal Maritime Observatory, Trieste, until the outbreak of war.

The Monthly Meteorological Bulletin, which includes the Daily Weather Report, was distributed to the principal observatories and scientific institutions of the world.

Beginning with 1914 January 1, a charge of \$10 a year has been made for supplying firms and private individuals with the Daily Weather Report. This has had the desired effect of reducing the distribution list and so accelerating delivery.

Daily Weather Telegrams.—Daily Weather Telegrams from East Coast Ports, Indo-China, the Philippines, and the Japanese Empire have been received with commendable regularity throughout the year. The service from Wladivostock was interrupted from August 5 to October 25.

There has been no improvement in the services from Hoihow, Pakhoi, and the central China stations.

In the month of November, a scheme for the improvement of the service of weather telegram exchanges in the Far East, was submitted to the Cable Companies and approved by the Head Office in London.

The scheme embodies certain of the resolutions passed at the Meteorological Conference held at Tokio in May, 1913. It lightens considerably the burden on the Telegraph Companies, and at the same time provides for increased and uniform information from each reporting station, namely—barometric pressure, wind direction and force, weather, temperature, and humidity, at 6 a.m. and 2 p.m. daily, and the inclusion of 12 representative stations in the Japanese telegrams in place of 10. It also provides for information from more representative stations in the Philippines to be sent to the Hongkong, Macao, Phulien, Taihoku, Tokio, and Zikawei Observatories.

The following is the code which the Observatories have been requested to adopt from 1915 February 15.

Proposed letter Code for Weather Telegrams.

Code letter.	Barometer and Force.	Wind Direction.	Wind Force and Weather.			Temperature. (°)	Dry-wet. (°)	Code Time, [¶]
			Fourth letter.					
			First letter. m.m.s.	Second letter.	Third letter.	Beaufort.	m. p. s.	Fifth letter.
a	714 [†]	0°0		N	0-1	0-1°5		° °
b	717	0°3		NNE	2	1°6-3°3	-28	+11 0°2
c	720	0°6		NE	3-4	3°4-8°0	-26	+12 0°4
d	723	0°9		ENE	5-6	8°1-13°8	-24	+13 0°6
e	726	1°2		E	7	13°9-17°1	-22	+14 0°8
f	729	1°5	No Fog.	ESE	8	17°2-20°7	-20	+15 1°0
g	732	1°8		SE	9-10	20°8-28°4	-18	+16 1°2
h	735	2°1		SSE	11-12	>28°4	Fine, detached clouds, or blue sky.	-16
i	738	2°4		S	0-1	0-1°5		+17 1°4
j	741	2°7		SSW	2	1°6-3°3	-14	+18 1°6
k	744	0°0		SW	3-4	3°4-8°0	-12	+19 1°8
l	747	0°3		WSW	5-6	8°1-13°8	-10	+20 2°0
m	750	0°6		W	7	13°9-17°1	-8	+21 2°5
n	753	0°9		WNW	8	17°2-20°7	Cloudy or Overcast.	+22 3°0
o	756	1°2	Fog.	NW	9-10	20°8-28°4		3°5 1 p.m.
p	759	1°5	Fog.	NNW	11-12	>28°4	-6	+24 4°0
q	762	1°8		Calm	0-1	0-1°5	-2	+25 4°5
r	765	2°1		...	2	1°6-3°3	+1	+26 5°0
s	768	2°4		...	3-4	3°4-8°0	+2	+27 5°5
t	771	2°7		...	5-6	8°1-13°8	+3	+28 6°0
u	774	...		...	7	13°9-17°1	+4	+29 6°5
v	777	...		...	8	17°2-20°7	+5	+30 7°0
w	780	...		...	9-10	20°8-28°4	+6	+31 7°5
x	783	...		...	11-12	>28°4	+7	+34 8°0
y	786 [†]	+8	+36 9°0
z	—	...		...	...	....	+9	+38 10°0
						Rain.	...	11 Midn.

[†] or below.[‡] or above.

z = no instrumental readings.

[¶] as used by the Cable Companies.

Extra Weather Telegrams.—The following stations send extra weather telegrams at half-rates, during typhoons, on receipt of certain code words from Hongkong:—Amoy, Canton, Macao, Phulien, Sharp Peak, and Taihoku. The Director of the Philippines Weather Bureau also sends extra telegrams at his discretion, from Aparri, or some other station nearer the typhoon centre.

From May to October the 9 p.m. observations at Swatow, in addition to the 6 a.m. and 3 p.m., were forwarded to the Observatory by the Customs authorities, as in previous years.

By the courtesy of the Naval authorities meteorological observations made on board His Majesty's ships were occasionally forwarded to the Observatory by wireless telegraphy. The last was received on July 20.

Results of Weather Forecasts.—The results of comparison of the daily weather forecasts with the weather subsequently experienced are given below, with the results of the previous five years:—

Year.	Complete Success.	Partial Success.	Partial Failure.	Total Failure.
	%	%	%	%
1909.....	58	32	8	2
1910.....	58	32	9	1
1911	55	32	11	2
1912.....	62	34	3	1
1913..	66	28	3	3
1914.....	62	32	5	1

Storm Warnings.—Storm warnings according to the "China Coast" code, and the local code, were displayed when necessary. Others according to the Hongkong telegraphic code were sent to the following ports:—Amoy, Swatow, Sharp Peak, Macao, Canton, Pakhoi, Hoihow, Phulien, Manila, Labuan, and Singapore. For the benefit of vessels taking shelter in Kowloon Bay and to the west of Stonecutters Island, the local warnings are repeated at Lyendum by the Military authorities and at Lai-Chi-Kok by the Standard Oil Company.

In the following table are given the number of hours the local signals were hoisted in each of the years 1909-14:

Year.	Red Signals.	Black Signals.	Bombs.
	Number of hours.		Number of times fired.
1909	233	458	1
1910	80	196	...
1911	73	377	2
1912	151	164	...
1913	146	189	1
1914	146	178	...

The red signals indicate that the centre of the typhoon is believed to be more than 300 miles distant and the black less than 300 miles. Three bombs fired at intervals of 10 seconds indicate that winds of typhoon force are anticipated.

The figures in the above table include the number of hours that night signals, corresponding to the red and black day signals, were hoisted.

V.—METEOROLOGICAL OBSERVATIONS FROM SHIPS, TREATY PORTS, &c.

Logs received.—In addition to meteorological registers kept at about 40 stations in China, meteorological logs were received from 308 ships operating in the Far East. These logs, representing 17,011 days' observations, have been utilised for determining typhoon tracks. The corresponding figures for the year 1913 were 290 and 18,006.

Comparison of Barometers.—During the year more than 2,000 comparisons of ships' barometers have been made by means of observations taken when in harbour, and several direct comparisons of barometers for ship masters and various persons in the Colony.

Material for Pilot Charts.—Some progress has been made with this work. The mean values of barometric pressure, wind direction, and force, in degree squares, have been deduced for each month of the year. Means for 2 degree squares have been formed for the months of January to July. A pilot chart showing these elements has been completed for January, and isobars drawn for the months of January to July. They have revealed some interesting effects of islands on the distribution of atmospheric pressure.

VI.—MAGNETIC OBSERVATIONS.

Absolute determinations of magnetic horizontal force, dip, and declination were made near the middle of each month with instruments of the Kew pattern. In the determinations of horizontal force two sets of deflection observations were made, one before and one after the vibration observations. Four dip needles were used in rotation, two on one day of each month.

The Kew Magnetometer No. 83 was sent to England to be altered in February, but had not been returned by the end of the year.

The azimuth of the north magnetic mark was re-determined in the months of February and March, with a 5-inch micrometer theodolite loaned by the Public Works Department. The results of each night's observations were as follows:—

Date.	Azimuth.
February 23rd,	10° 17' 43" E of North
24th,	10 17 34
March 1st,	10 17 26
Mean,	10 17 34

No alteration has been made in the adopted value, which has been $10^{\circ} 17' 30''$ since the year 1884.

The mean values of the magnetic elements for the years 1913 and 1914 were as follows:—

	1913.	1914.
Declination (west)	$0^{\circ} 6' 13''$	$0^{\circ} 8' 31''$
Dip (north)	30 53 41	30 53 28
Horizontal Force (C.G.S. unit) ...	0.37172	0.37192
Vertical Force (C.G.S. unit)	0.22242	0.22351
Total Force (C.G.S. unit)	0.43318	0.43340

VII.—TIME SERVICE.

A detailed description of the time service installation, together with a discussion of the rates of the electric transmitter under varying conditions of friction and impulse, was published as an appendix to the Hongkong Observations, 1913.

Time-Ball.—The Time-Ball on Blackhead Hill is dropped daily at 13^h Hongkong Standard Time (5^h a.m. of Greenwich Time). The ball is also dropped at any other hour in case of necessity. No application for a supplementary time signal was made in the year 1914. The ball was dropped successfully 362 times. There were two failures, on March 17 and December 17, owing to inadvertent disconnections during alterations.

The ball was not raised on September 3 owing to strong wind. It fell with an error of +3 or less on 392 occasions, with an error of 0°1 or 0°5 on 25 occasions, and 0°6 or 0°7 on 14 occasions. Errors of 0°8 occurred twice, of 0°9 four times, of 1°0 three times, and 1°1 and 1°2 once each. The probable error ranged from 0°14 in February, September and October to 0°2 in December.

A proposal to heighten the time-ball tower, and also the mast, is under consideration. In the month of March the time-ball wire was run on Government poles along the railway to prevent interference and accidental earthing, or contact with other lines.

Transit instrument.—Observations for time were made daily with the Zösch transit instrument and the Hipp time-chronograph by the Chinese computers, weather permitting.

The number of observations in the years 1913 and 1914 were as follows:—

	1913.	1914.
Transits.	1,118	1,803
Level determinations.	298	893
Azimuth	80	47
Collimation	47	43

Transits of the sun were only observed when star transits were not available from the previous night.

The azimuth and collimation determinations were made by the Chief or First Assistant, usually once a week. The azimuth determinations depend usually on observations of the north and south marks.

A new object glass was fitted on January 4. The value of one revolution of the micrometer screw was re-determined on January 6 and 8, with the following results:

January 6	4.035
... 8	4.927

In the month of January the lamps used for illuminating the field of view were removed from their original supports on the instrument and set up in sockets on the east and west walls of the room, in order to minimise their heating effect on the instrument. One end of the horizontal axis was filled with a lens to collect sufficient rays for illuminating the threads.

The thread intervals were re-determined on April 28 and May 16.

On August 18 a ruled glass scale was substituted for the spider threads, which are unsuited to the large variations of humidity experienced in Hongkong. It was found however that the lines on the glass were too fine, being almost invisible in certain lights.

Scales with more distinct lines have been ordered. On the same date the counting comb was removed and a new micrometer head fitted for recording the revolutions of the screw; a worm wheel on the head operating a graduated dial.

Clocks.—The daily losing rate of the sidereal Standard clock (Dent 39741) varied from $+0^{\circ}60$ on January 3, to $-1^{\circ}01$ on several days in the summer. At the former rate the barometric pressure was $30^{\text{ins}}.24$, and the temperature of the clock room $60^{\circ}9$. At the latter rate the barometric pressure varied from $29^{\text{ins}}.39$ to $29^{\text{ins}}.65$ and the temperature from 82° to 85° . The excess of the observed over the calculated rate, after cloudy periods is given below:—

Excess of observed over calculated errors of Dent No. 39741, after cloudy periods in the year 1914.

Date 1914.	Interval without observations.	Excess of observed over calculated error.		Date 1914.	Interval without observations.	Excess of observed over calculated error.	
		d.	s.			d.	s.
January 10.	2	-0.33	2	July	2	+0.30	
" 23	2	+0.26	5	"	5	+0.35	
February 5	3	+0.29	10	"	+	-0.04	
" 8	3	+0.34	9	"	9	-0.21	
" 11	3	-0.13	1	"	+	+0.31	
" 19	2	+0.49	8	"	8	+0.73	
March 1	4	-0.03	21	"	6	-0.19	
" 7	2	+0.25	2	"	2	-0.40	
" 17	9	+0.28	3	"	3	+0.21	
" 28	4	-0.51	14	"	4	+0.40	
April 11	10	+0.25	28	"	5	+0.15	
" 18	4	+0.59	3	"	6	+0.10	
" 23	2	+0.25	10	"	2	-0.24	
" 26	3	+0.82	13	"	5	-0.10	
" 31	4	+0.15	25	"	5	-0.62	
May 13	5	+0.25	28	"	6	-0.24	
" 17	2	+1.00	2	"	6	+0.48	
" 20	6	+0.73	12	"	2	+0.21	
" 31	2	+0.25	27	"	+	+1.17	
June 10	5	+0.21	31	"	3	-0.21	
" 13	3	+0.34	"				

The Dent mean time clock, No. 39740, was used for automatically dropping the time-ball until June 24, when it was sent to England to have an invar pendulum fitted, and also electric contact springs for emitting 2-second signals. The Brock mean time clock was brought into use on June 25. It had recently been fitted with an invar pendulum and electric contacts for emitting 2-second, minute and hour signals. The contacts are similar to those described on page 105 of the Report of the Chief Astronomer, Canada. Some trouble has been experienced with the minute and hour contacts on account of the shape and size of the jewels, which do not admit of a clean drop off the tooth of the cam without the latter touching the contact lever, and so making a short circuit through the clock. This defect was however utilised for making the hour contact, one lever being held permanently off the cam, and the contact made by the rubbing of the end of the other contact lever against the tooth of the cam. New levers were provided for the minute contacts, with jewels projecting from their sides. The original levers were returned to England to have suitable jewels fitted, for use when necessary.

The coils of the accelerator and retarder were found to be defective. They were therefore rewound. A correction of 1 second can now be obtained in about 8 minutes, with the ten cell accumulator working through a 66 ohm resistance coil. In spite of the new invar pendulum rod, the temperature co-efficient of which was found to be nil, the rate of this clock has only been moderately good. After a steady rate for several days, relatively large variations occur for which no reason can be assigned. The clock is corrected daily by the electric regulating apparatus, and its daily rate is usually kept within 0°5 by the addition or removal of weights from the pendulum.

Though kept stationary on a table near the sidereal Standard clock, Chronometer Kullberg No. 8546, which was purchased in 1913, has not maintained the steady rate reported last year. It varied from +0°3 on January 20 to 2°9 on December 26, under nearly identical conditions of temperature and barometric pressure. There appear to be fortuitous variations superposed on a "time factor".

The electric impulse dials in various parts of the building have required no adjustment.

Experiments with the electric transmitter under varying conditions of friction and impulse indicated that the pallet required to be jewelled and the bearings of the gravity arm improved, in order to obtain the best results from this type of clock.

Attempts to render the cylindrical glass cover airtight have proved unsuccessful.

Time Signals by Wireless Telegraphy.—Provision has been made on the Estimates for the purchase of apparatus for automatic emission of wireless time signals according to the International

code, and an outfit for recording similar time signals, and weather reports.

VIII.—MISCELLANEOUS.

Lee Equatorial.—In the month of April the Lee 6-inch Equatorial, which had been dismounted for many years, was returned to the Royal Observatory, Greenwich, by direction of His Excellency the Governor.

Visitors.—Among the visitors to the Observatory during the year were:—

His Excellency the Governor, Sir F. H. May; the Honourable the Colonial Secretary, Mr. Claud Severn; the Director of the Geological Survey, Pekin, Mr. V. K. Ting; the Director of the Zikawei Observatory, the Rev. Father Froc, S. J.; the Coast Inspector, Chinese Maritime Customs, Mr. F. W. Tyler; the President, Canton Christian College, Dr. C. K. Edmunds; and several officers of the Army and Navy (British, French, Italian, and Japanese). Many commanders of vessels called to make enquiries concerning the weather they were likely to encounter after leaving Hongkong, and similar enquiries were made and answered by telephone.

Staff.—There was no change in the European staff during the year. Sixth grade telegraphist, Leung King-kwong, was transferred to the Harbour Department as fifth grade telegraphist on October 3, and Chan Tu-fong appointed sixth grade telegraphist on October 5. Miss Doberck, the assistant meteorologist, returned from 10 months leave of absence on March 22.

The Director acted as a Cable Censor for four hours daily, from October 5; and the Chief and First Assistants from September 1.

Expenditure.—The annual expenditure on the Observatory for the past ten years is as follows:—

Year.	Total Expenditure.	Increase.		Decrease.	
		\$	c.	\$	c.
1905	21,220.40	.....		716.75	
1906	19,995.17	.....		1,225.23	
1907	20,110.53	115.36		.....
1908	21,110.61	1,000.08		.....
1909	22,388.63	1,278.02		.....
1910	21,787.55	.....		601.08	
1911	23,353.02	1,565.47		
1912	22,595.08		757.94	
1913	24,255.49	1,660.41		
1914	25,398.31	1,142.82		

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T. F. CLAXTON,
Director.

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